

### **REMARKS**

Reconsideration and allowance of this application are respectfully requested in light of the foregoing amendments and the following remarks.

### **STATUS OF THE CLAIMS**

Claims 1, 2, 4, 5, 8-11 and 13 are pending.

Claims 1, 2, 4, 8-11 and 13 are rejected under 35 U.S.C. 112.

Claims 1, 2, 4, 8-11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over International Publication No. WO 03/020821A1 ("Schramm") in view of U.S. Patent No. 5,032,632 ("Saxton").

Claim 1 has been amended, Claims 2-7, 10, and 12 have been cancelled.

Support for amended Claim 1 is found in the Specification on Page 4, Lines 18-23 (description of the polymer); Page 6, Lines 10-13 and 24-27 (antioxidants), and page 7, Lines 4-6 (amount of antioxidants).

No new matter has been added.

### **THE INVENTION**

The instant invention, as now presented in amended Claim 1, is a pipe consisting essentially of:

an ethylene alpha-olefin interpolymers, wherein said ethylene alpha-olefin interpolymers has a density in the range of 0.925 to 0.965 g/cc, a melt index (I<sub>2</sub>) in the range of 0.05 to 5 g/10 minutes; and

an antioxidant system, wherein said antioxidant system consist essentially of;

from 500 to 5000 ppm of 3,3',3'',5,5',5''-hexa-tert-butyl- $\alpha,\alpha'$ ,  $\alpha''$ -(mesitylene-2,4,6-triyl)tri-p-cresol;

from at least 300 to 5000 ppm of Pentaerythritol Tetrakis(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate), Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate, or combinations thereof;

optionally one or more metal deactivators;

wherein said pipe has an F time in Jana Laboratories Procedure APTF-2 of at least 1000 hours, under the following conditions: pH 6.8 ( $\pm 0.1$ ); Chlorine 4.1 mg/L ( $\pm 0.1$ ); Nominal ORP 830mV; fluid temperature 110°C ( $\pm 1$ ); air temperature 110°C ( $\pm 1$ ); pressure 70 psig ( $\pm 1$ ); flow rate 0.1 US gallons/min ( $\pm 10$  percent).

#### **DISCUSSION WITH REGARD TO SECTION 103(a) REJECTION**

Claims 1, 8-9, and 13 are non-obvious over the over International Publication No. WO 03/020821A1 ("Schramm") in view of U.S. Patent No. 5,032,632 ("Saxton") under 35 U.S.C. 103(a) for the reasons stated below.

To reject claims in an application under section 103, an examiner must show a *prima facie* case of obviousness. *In re Deuel*, 51 F.3d 1552, 1557 (Fed. Cir. 1995). Furthermore, all words in a claim must be considered in judging the patentability of that claim against prior art. *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970). In addition, to establish a *prima facie* case of obviousness, the following three basic elements must be met: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) the prior art reference or references when combined must teach or suggest all the claim limitations; **and** (3) there must be a

reasonable expectation of success. MPEP § 2143. Finally, if an independent claim is non-obvious under 35 U.S.C. 103, then any claim depending therefrom is non-obvious. *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988).

First, there is no motivation or suggestion to combine or modify the teachings of the above cited references to achieve , as now presented in amended Claim 1, is a pipe consisting essentially of:

an ethylene alpha-olefin interpolpolymer, wherein said ethylene alpha-olefin interpolpolymer has a density in the range of 0.925 to 0.965 g/cc, a melt index (I<sub>2</sub>) in the range of 0.05 to 5 g/10 minutes; and

an antioxidant system, wherein said antioxidant system consist essentially of;

from 500 to 5000 ppm of 3,3',3'',5,5',5''-hexa-tert-butyl- $\alpha,\alpha'$ ,  $\alpha''$ -(mesitylene-2,4,6-triyl)tri-p-cresol;

from at least 300 to 5000 ppm of Pentaerythritol Tetrakis(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate), Octadecyl-3-(3,5-di-tert.butyl-4-hydroxyphenyl)-propionate, or combinations thereof;

optionally one or more metal deactivators;

wherein said pipe has an F time in Jana Laboratories Procedure APTF-2 of at least 1000 hours, under the following conditions: pH 6.8 ( $\pm 0.1$ ); Chlorine 4.1 mg/L ( $\pm 0.1$ ); Nominal ORP 830mV; fluid temperature 110°C ( $\pm 1$ ); air temperature 110°C ( $\pm 1$ ); pressure 70 psig ( $\pm 1$ ); flow rate 0.1 US gallons/min ( $\pm 10$  percent).

There is no motivation because the teachings of the cited references, individually or combined as explained hereinabove, fail to disclose anything about the required amounts of the two classes of antioxidants present in the antioxidant system of the instant invention, i.e. from 500 to 5000 ppm of 3,3',3'',5,5',5''-hexa-tert-

butyl- $\alpha$ , $\alpha'$ ,  $\alpha''$ -(mesitylene-2,4,6-triyl)tri-p-cresol; and from at least 300 to 5000 ppm of Pentaerythritol Tetrakis(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate), Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate, or combinations thereof. While Schramm is silent as to the specific amounts of the two classes of antioxidants present in the antioxidant system as required by the instant invention, Saxton actually teaches away from the instant invention, i.e. "the amount of hindered phenolic antioxidant should be between 0.05 to 0.5, preferably from 0.10 to 0.3, **weight percent**. Saxton teaches away from the instant invention because it requires much higher amounts than the required amounts of the two classes of antioxidants present in the antioxidant system of the instant invention, i.e. from 500 to 5000 ppm of 3,3',3'',5,5',5''-hexa-tert-butyl- $\alpha$ , $\alpha'$ ,  $\alpha''$ -(mesitylene-2,4,6-triyl)tri-p-cresol; and from at least 300 to 5000 ppm of Pentaerythritol Tetrakis(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate), Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate, or combinations thereof.

Therefore, there is no motivation or suggestion to combine or modify the teachings of the above cited references to achieve the pipe of the instant invention, as described in amended claim 1.

Second, even if, *arguendo*, there is a suggestion or motivation to combine the teachings of the above-mentioned cited references, their combined teachings fail to teach each and every required element of the instant invention, as now presented in amended Claim 1. The combined teachings of the above cited references fail to teach each and every element of the instant invention because none of above cited references, as explained above, mentions anything about the required amounts of the two classes of antioxidants present in the antioxidant system of the instant invention, i.e. from 500 to 5000 ppm of 3,3',3'',5,5',5''-hexa-tert-butyl- $\alpha$ , $\alpha'$ ,  $\alpha''$ -(mesitylene-2,4,6-triyl)tri-p-cresol; and from at least 300 to 5000

ppm of Pentaerythritol Tetrakis(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate), Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate, or combinations thereof. The required amounts of the two classes of antioxidants present in the antioxidant system of the instant invention is important because it the pipes according to this invention achieve the desired properties so long as the required amounts of the two classes of antioxidants present in the antioxidant system of the instant invention is with the permissible ranges, i.e. from 500 to 5000 ppm of 3,3',3'',5,5',5''-hexa-tert-butyl- $\alpha,\alpha',\alpha''$ -(mesitylene-2,4,6-triyl)tri-p-cresol; and from at least 300 to 5000 ppm of Pentaerythritol Tetrakis(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate), Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate, or combinations thereof. Such incentive pipes have an F time in Jana Laboratories Procedure APTF-2 of at least 1000 hours, under the following conditions: pH 6.8 ( $\pm 0.1$ ); Chlorine 4.1 mg/L ( $\pm 0.1$ ); Nominal ORP 830mV; fluid temperature 110°C ( $\pm 1$ ); air temperature 110°C ( $\pm 1$ ); pressure 70 psig ( $\pm 1$ ); flow rate 0.1 US gallons/min ( $\pm 10$  percent), and such improved properties are reported in Table of Pages 9, as shown below.

Sample	AO1	MD	AO2	AO3	AO4	AO5	F time (hr)
1	2329	621	0	960	0	399	1473
2	2373	648	0	959	0	422	1088
3	2207	644	32.4	930	0	413	1531
4	0	500	0	1085	0	401	841
5	0	815	0	1099	0	388	991
6	982	521	1020	959	0	422	957
7	0	0	0	1660	1259	410	1496
8	1336	711	1020	956	0	408	989
9	2200	764	0	0	225	0	1050
10	0	0	0	2000	1800	0	398
11	0	0	0	1200	0	500	386
12	2250	750	0	1190	1022	497	1237
13	0	750	0	1191	2252	497	1336
14	2250	750	0	1190	1022	497	1232
15	1500	750	0	1190	2012	497	1622
16	2250	0	0	1191	1022	497	1330
17	3375	1125	0	1190	2	496	1351
18	4500	1500	0	1188	2	496	1275
19	3375	750	0	1188	2012	496	1524

Therefore, the combined teachings of the above cited references fail to teach each and every element of the instant invention.

Accordingly, the first two requirements to establish a *prima facie* case of obviousness have not been met; therefore, the Examiner has failed to establish a *prima facie* case of obviousness.

Furthermore, if an independent is non-obvious under 35 U.S.C. 103, then any claim depending therefrom is non-obvious. *In re Fine*, 837 F. 2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Claims 8-9, and 13 depend from Claim 1; therefore, Claims 8-9, and 13 are non-obvious.

Accordingly, the above 103 rejections should be removed.

### **DISCUSSION WITH REGARD TO SECTION 112 REJECTION**

Support for amended Claim 1 is found in the Specification on Page 4, Lines 18-23 (description of the polymer), i.e.

The present invention provides a polyethylene resin with a density of at least about 0.925 g/cc, more preferably about 0.930 g/cc, most preferably about 0.940g/cc. The polyethylene resin can have a maximum density of about 0.965 g/cc. The resin should also have a melt index ( $I_2$ ) in the range of from 0.05 g/10 minutes to 5 g/10 minutes, more preferably in the range of 0.1 to 1 g/10 minutes. The resin can also advantageously have a multimodal molecular weight distribution. Preferred resins for use in the present invention,

Claims 2-7, 10-12 have been canceled. Accordingly, the 112 rejection should be removed.

**CONCLUSION**

In view of the forgoing, Applicant respectfully requests that the rejections be overturned and that the instant application be allowed to proceed to issuance.

Respectfully submitted,

June 5, 2009

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